

High Level of Control Quality and Simple Application

Automated ammonia dosing in power plants

MPT Meß- und Prozeßtechnik GmbH, headquartered in Rodgau near Frankfurt am Main, Germany, specializes in plant engineering for dosing chemicals. Its portfolio includes planning, consulting, service, as well as implementation of components and systems for preparing and dosing chemicals in chemical processes and in water treatment. MPT worked together with the JUMO Engineering team to implement an ammonia dosing system.

The system is used for boiler water treatment in a power plant in Bolivia. Here, particularly stringent requirements are placed on the dosing pumps as well as on the safety and reliability of the entire dosing system. This is because any deposits or even corrosion in the systems or on components of the water-steam circuit can jeopardize the correct operation of the power plant.

Different approaches are taken to prevent such contamination. In addition to feed water treatment (where the salt is removed from the water), alkalization of water and steam as well as condensate polishing are also required. Various chemicals such as carbonylhydrazide, ammonia water, trisodium phosphate, and – depending on the selected method – oxygen and caustic soda can be used for this purpose.

The ammonia dosing stations are generally lockable ISO containers for outdoor use. The ammonia solution is filled into a batching tank and is then diluted with water. The diluted solution is then fed into the process.

The aim here is to control the conductance of the boiler water as accurately as possible. That is why the control quality plays a crucial role. MPT GmbH worked together with the JUMO Engineering department when developing this application. This team bundles the decades of company experience in industrial measurement/control/automation technology, supports customers throughout the entire project management, and develops customized applications for a variety of industries.

The Engineering team has an extensive portfolio. It ranges from running basic feasibility studies and workshops through to drawing up requirement and system specifications and end-to-end project management. The team has extensive experience in PLC programming, visualization, and network technology. Here, customer applications are developed and created based on JUMO products.

The JUMO mTRON T measurement, control, and automation system was used to implement the ammonia dosing system. The modular system with its

universal input and output modules, flexible connection technology, and comprehensive communication/evaluation/automation software can be used in a vast range of industries.

In this application, two control loops are used for the feed water and condensation water. The plant can be run in both manual and automatic mode. In automatic mode, the control system is active. In manual mode, the quantity of ammonia is specified according to a fixed formula depending on the flow. To control the process as accurately as possible, the flow at the present time is also acquired as an auxiliary variable. It determines the quantity of ammonia to be dosed. This requirement is met using disturbance feedforward control, which was implemented individually for the customer in the CODESYS environment of the automation system.

A process screen provides the user with a complete overview of the plant. Depending on the user's authorizations, further process screens may allow easy editing of process values and limit values.

Through the effective combination of services from JUMO Engineering and the flexible JUMO mTRON T system, MPT Meß- und Prozeßtechnik GmbH was able to provide a customized, easy-to-use solution.

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Fig. 1: Entire plant



Fig. 2: Control cabinet with operating display



Fig. 3: JUMO sensor technology in use



Fig. 4: The JUMO mTRON T modular automation system